Service Manual SHARP

MODEL

STM-31

GENERAL DESCRIPTION

All silicon transistor design with OTL (Output Transformerless) and ITL (Input Transformerless) circuits ensure distortion-free sound reproduction.

Extra-wide 20Hz – 30kHz power band width, unsurpassed 0.08% THD and high 50db channel separation.

The superior BASS & TREBLE controls select the highest standard of tonal values with maximum sensitivity.

The unique TONE CANCELLER switch produces a true-to-life sound free-from "phase shift".

The SPEAKER CHANGEOVER switch easily allows to enjoy two speaker systems in different places.

The TAPE MONITOR switch, MODE SELECTOR switch, TOP-TONE SELECTOR switch, LOUDNESS CONTOUR switch and many other "deep-think" extras.

Independent use of pre-amplifier or main-amplifier widens the advanced features of the unit.

Includes connection systems for players, tape recorder, tape deck and other audio units, DIN socket for tape recording and playback, and HEADPHONE terminal for private listening.

SPECIFICATIONS

Power Source 110/220/240V
50/60 Hz

Power Consumption ..... 60W max.

Circuit: ..... All silicon transistor pre, main-amp. with OTL & ITL circuits

Transistors & Diodes 18-transistor, 6-diode

Dynamic Output ..... 21W + 21W (at 1% THD)

T.H. Distortion ..... 0.08% (at 5W output)

Power Band Width ..... 20 Hz – 30 kHz

Frequency Range ; ..... 20 Hz – 100 kHz

Channel Separation ..... 50 db

Hum & Noise
Residual ..... 2.5 mV
Maximum Volume .. PHONO: 8 mV
AUX & Tuner: 2.5 mV

Input Terminal Sensitivity (at 12W output)
PHONO-1: 2 mV, (MAGNETIC)
140 mV, (CERAMIC)
PHONO-2: 2 mV
AUX-1: 170 mV
AUX-2: 170 mV
Tuner : 170 mV

Recording/Playback Characteristics RIAA
Standard Curve .....
Tape Input Sensitivity: 200 mV
Recording Output Level: 30 mV

Loudness Contour ..... +7 db at 100 Hz
+4 db at 10 kHz

Tone Control ..... Bass ± 10 db at 100 Hz
Treble ± 10 db at 10 kHz

Pre-amp. Output Level ... 150 mV (1.5 mV, PHONO input)

Main-amp. Input Sensitivity .... 150 mV at 10W output

Dimensions ..... 340mm (W) x 104mm (H) x 233mm (D)

Weight ..... 5 kg

SHARP CORPORATION OSAKA, JAPAN

TRANSISTORS & DIODES COMPLEMENT

Q101,Q102, Q103,Q104	2SC458LG Ⓒ.....	Audio Amplifier
Q301,Q302, Q401,Q402	2SC458LG Ⓑ	Audio Amplifier
Q403,Q404	2SC984 Ⓑ	Audio Amplifier
Q405,Q406	2SC984 Ⓑ	Phase Converter
Q407,Q408	2SA565 Ⓑ	Phase Converter
Q501,Q502, Q503, Q504	2SC1060Ⓑ	Audio Output
SR501,SR502	DS-1P	Power Rectifier
D401,D402, D403,D404	HV-23	Thermal Compensation

CHASSIS REMOVAL

1. Disconnect the power plug of the set.
2. Unscrew the 6 bolts (marked 1 in the figure) on the bottom, and the bottom board (marked 2) is removed, exposing the wirings on the chassis.
3. Unscrew the 4 bolts (marked 3) and remove the cabinet (marked 4) by pulling it out backward, the chassis and front panel will be removed from the chassis.
4. When removing the front panel (marked 5), remove the switch knobs and levers except push-buttons. After that, unscrew the up-and-down sides bolts on the panel (marked 6) and pull out the panel forward.

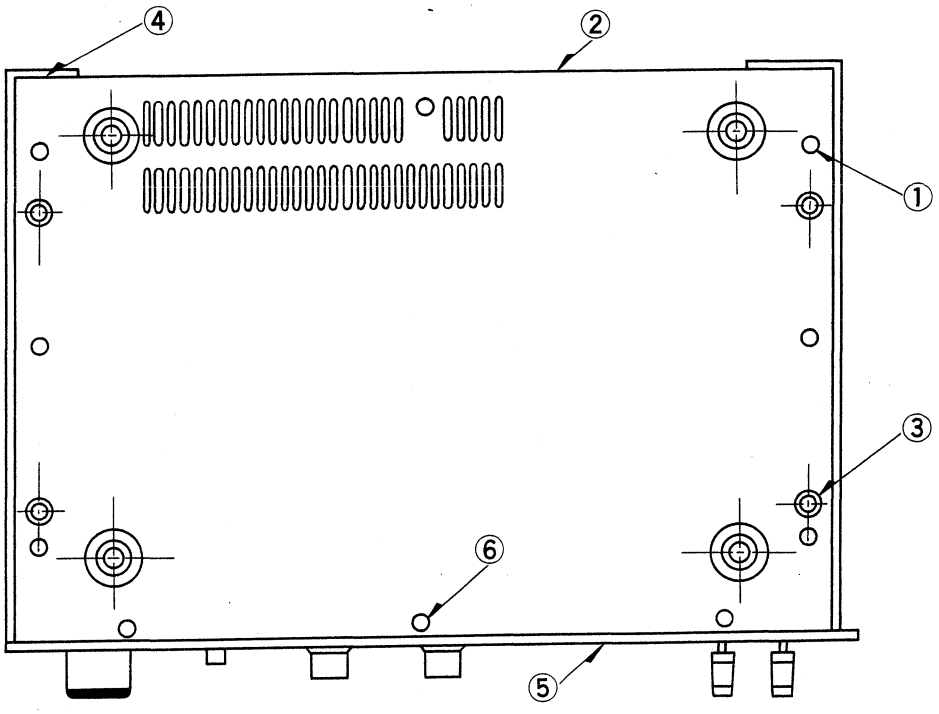


Figure 1 CHASSIS REMOVAL

ALIGNMENT

* Apparatus for Alignment
A tester or DC voltmeter

* Tool
A non-metallic screw

* Procedure

1. Turn the 500 ohm control R427, R428 fully clockwise.
2. Set the 100K ohm control R419, R420 in the mid-position.
3. Remove the leads of K413 (K401) and F503 (F504), Set the range of the tester to 25 – 50 mA and connect the tester in series with correct polarity.
4. After the above operations, switch power on.
5. Adjust R419 (R420) so that the voltage reading on K410 (K404) becomes half of K413 (K401).
6. Adjust R427 (R428) so that current becomes approximately 15 mA under no signal conditions.

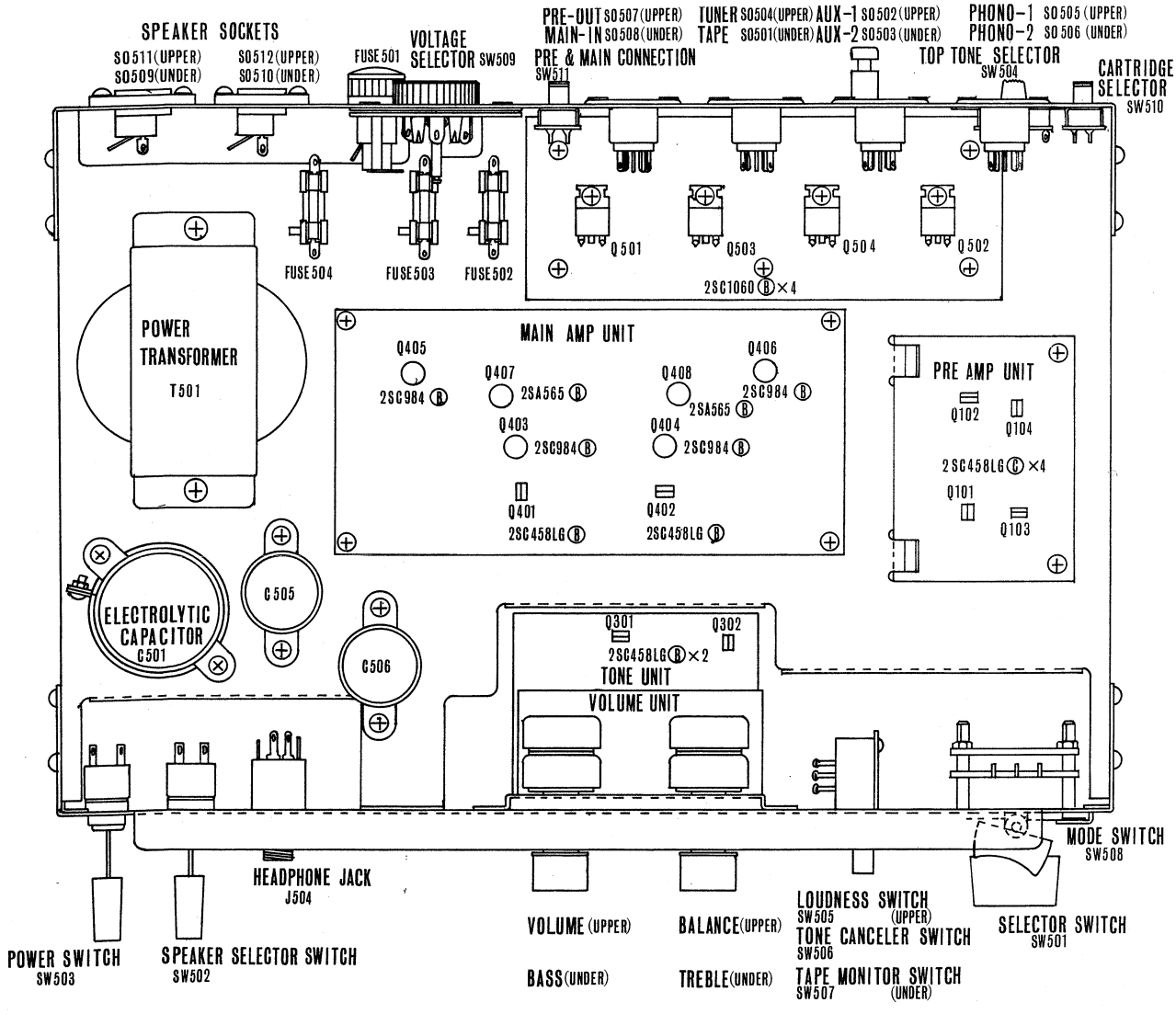


Figure 2 CHASSIS LAYOUT

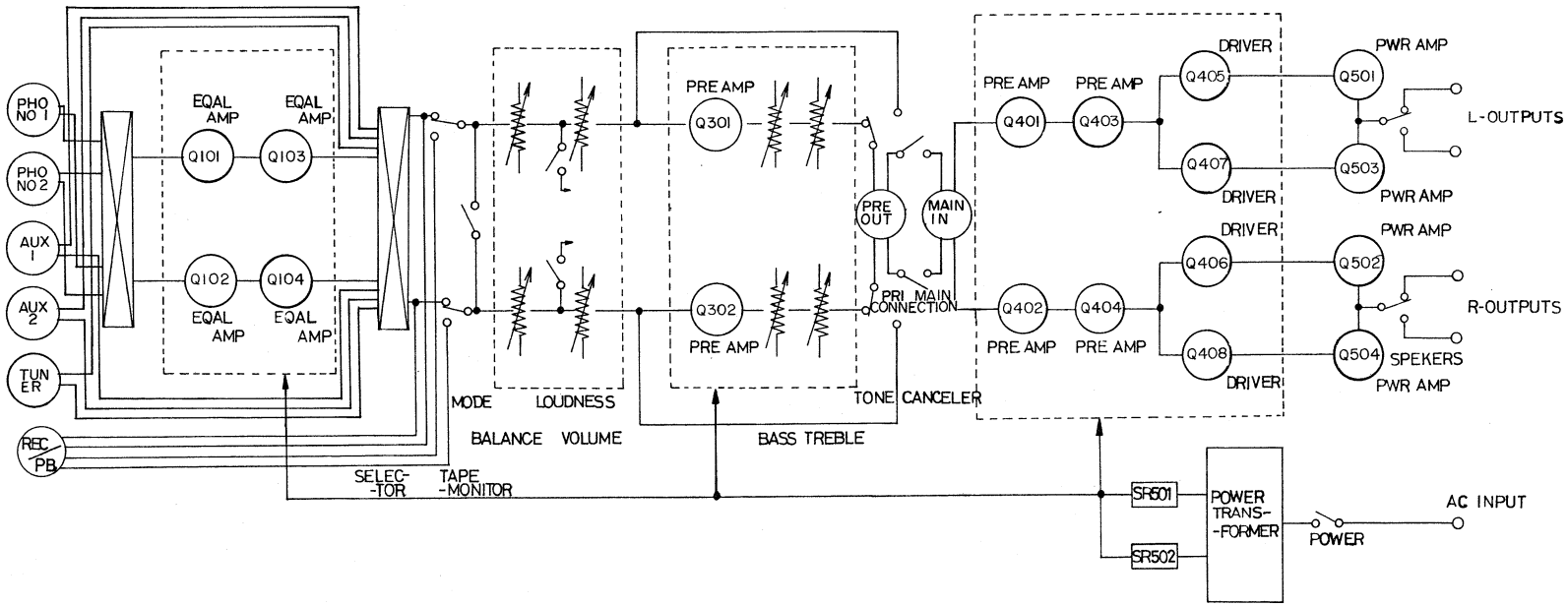


Figure 3 BLOCK DIAGRAM

CIRCUITRY

STM-31 stereo pre, min-amplifier consists of pre-amplifier circuit, volume circuit, tone circuit, main-amplifier circuit and power source circuit.

The pre-amplifier composed of Q102 and Q104 is a direct coupled amplifier. When connecting the moving magnet cartridge or the ceramic cartridge by use of the ceramic adaptor, selective negative feedback voltage is fed back from the collector of Q104 to the emitter of Q102 to be equalized to RIAA characteristics. (Refer to NOTE 1.)

The top tone selector in PHONO-2 is the circuit which selects high note by changing load resistor most suitable for the cartridge.

The output from the volume circuit is amplified by Q302 in the tone control circuit and feeds the output of the collector to the circuit which consists of the capacitor and resistor in the tone control circuit.

The tone canceller switch rejects waving of frequency characteristics and phase variation at the midst position of the BASS control and the TREBLE control in the tone circuit, and attracts flat frequency characteristics and phase characteristics.

The output of the tone control circuit is fed to the base of Q402. Signal output amplified at this stage is fed to the base of Q404 at the driver stage through C410.

The varistors D402 and D404 connected to the collector of the driver Q404 compensate for thermal deviation of Q406, Q408, Q502 and Q504.

Q406 and Q502 are connected in "Darligton amplifier" form. (Refer to NOTE 2.) Q408 and Q504 connected in "complementary amplifier" form invert phase of the audio signal through PNP transistor Q408 and NPN transistor Q406.

Q502 and Q504 function as a power amplifier. They are located on a heat sink board in order to protect them against excessive heat generated during high volume operation.

R428 connected to D402 and D404 is used for adjustment of the collector current of Q502 and Q504 under no signal conditions. When replacing the power transistors Q502 and Q504, readjustment of bias current by use of R428 is necessary.

R420 is connected to R422 in series. R420 is adjusted so that the collector voltage of Q504 is half the voltage value of the collector of Q502.

The speaker output is taken from the collector of Q504 through the capacitor of C506. One negative feedback voltage is fed back from the collector of Q504 to the emitter of Q402 through R466 and C422. Another negative feedback voltage is fed from the collector of Q504 to the emitter of Q402 through C420 and R432.

NOTE: 1. RIAA characteristics (Figure 4)

Sound sources on the record discs are generally recorded under the RIAA standard. The curve is characterized to strengthen gradually bass to treble.

For playing back these sound sources, the amplifier should have playback characteristics which gradually strengthen treble to bass. This is called "RIAA recording" or "Playback characteristics."

2. Darlington connection (Figure 5)

Two transistors are connected in a common collector form, to the emitter of a front transistor and to the base of a rear transistor in series.

Thus, these transistors compose a NPN type transistor as illustrated below. Higher current than a transistor is obtained. These transistors need fewer additional parts.

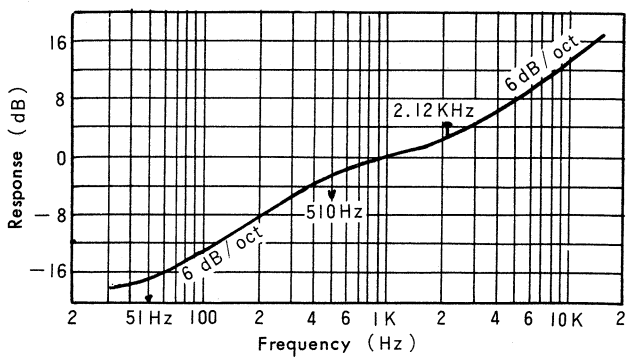


Figure 4 RIAA CHARACTERISTICS

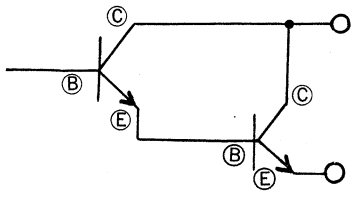


Figure 5 DARLINGTON CONNECTION

VOLTAGE SELECTOR PLUG & FUSE REPLACEMENT

1. AC LINE FUSE

When the unit does not function due to a blown fuse, remove the power cord and replace the old fuse on the fuse holder with a new one. Use a 1.2A fuse for 110V. 0.7A fuse for 220, 240V.
NOTE: When replacing the fuse, never use a copper wire or other fuse of improper capacity.

2. TRANSISTOR PROTECTION FUSE

In case the protection fuse has blown due to a short-circuit at the speaker terminal, etc., repair the troubles first and replace the old fuse with a new one. Be sure to use a slow blow fuse of 1.5A. Locate the fuse holder in the figure 7

3. PILOT FUSE

In case the pilot fuse has blown, repair the troubles first and replace the old fuse with a new one. Locate the fuse holder in the figure 7.

4. VOLTAGE SELECTOR PLUG

The voltage selector allows you to operate the unit on any of the following voltages; 110/220/240V. AC of 50/60 Hz. Each voltage is selected in the following manner:

1) Remove the plug cover by unscrewing the screws and pull out the plug.
2) Reinsert the plug so that the desired voltage comes upward and appears in the plug cover opening (Figure 6).
3) Replace the plug cover in its original position.

POWER TRANSISTOR REPLACEMENT

The power transistors used in the output stages are matched pairs. They have been selected so that they have very similar current gain and trans-conductance characteristics. This matching is necessary in order to assure optimum performance, but is such that if a transistor fails in either channel, another transistor in that channel must also be replaced. Transistors are supplied only in matched pairs for replacement.

The transistors diffuse a large amount of heat which must be carried off in order to prevent damage to the transistors, the collectors of which are thermally connected to the heat sink by means of electrical insulators to avoid grounding. The insulator is a very thin mica mounted between the transistor case (collector) and the heat sink. A layer of silicon grease which is a good conductor of heat is applied to both sides of the insulator in order to improve heat sink operation. When the power transistors are replaced the insulator mica must be re-installed and a new layer of grease applied to both sides. Care should be taken, lest conductive dust such as metal particles should break through the insulator mica Q501 and Q503, Q502 and Q504 are matched pairs.

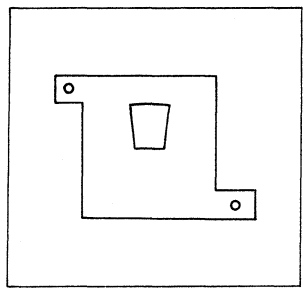


Figure 6 VOLTAGE SELECTOR

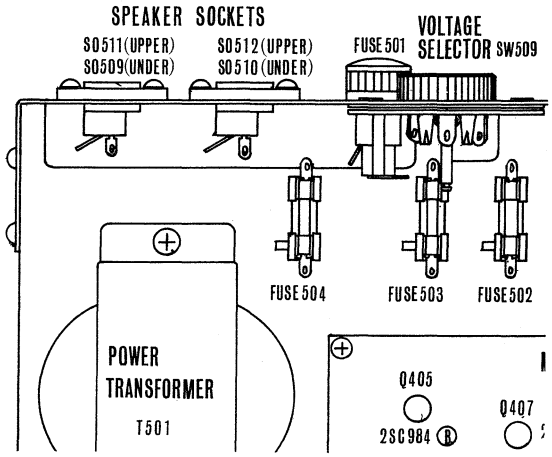


Figure 7 FUSE REPLACEMENT

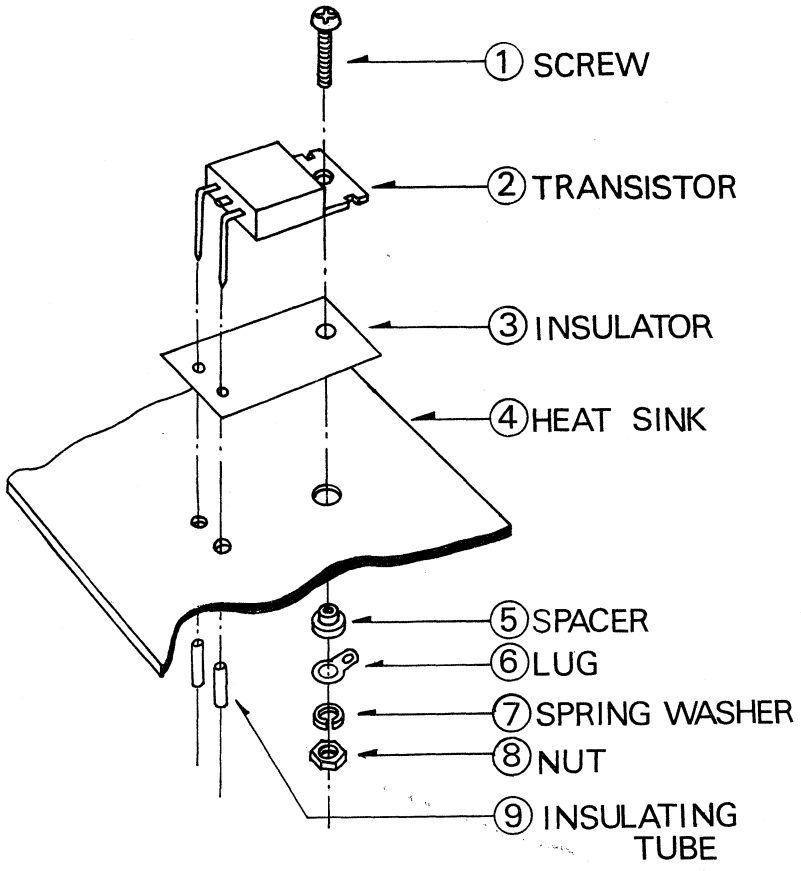
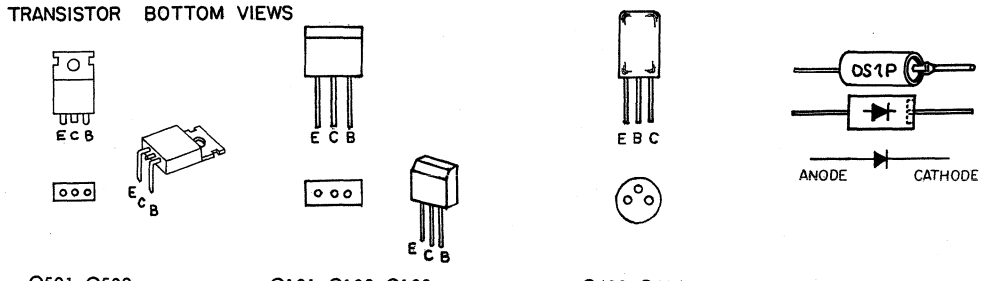


Figure 8 POWER TRANSISTOR REPLACEMENT

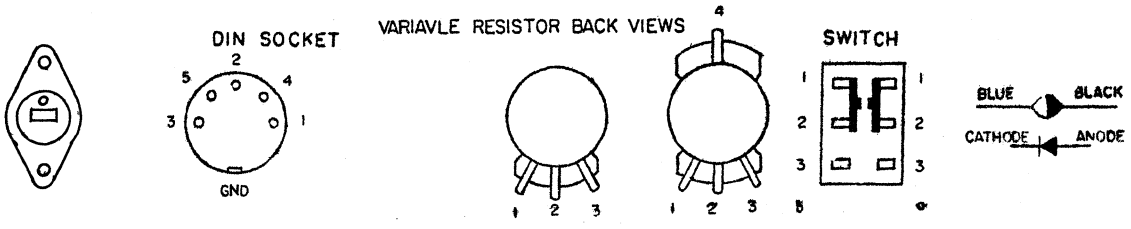


Q501, Q502
Q503, Q504

Q101, Q102, Q103
Q104, Q301, Q302
Q401, Q402

Q403, Q404
Q405, Q406
Q407, Q408

SR501, SR502



SO509
SO510
SO511
SO512

SO501, SO502
SO503, SO504
SO505, SO506
SO507, SO508

R206
R325
R326

R205

SW502, SW503
SW504, SW505
SW506, SW507
SW508, SW510
SW511

D401, D402
D403, D404

Figure 9 TERMINAL GUIDE

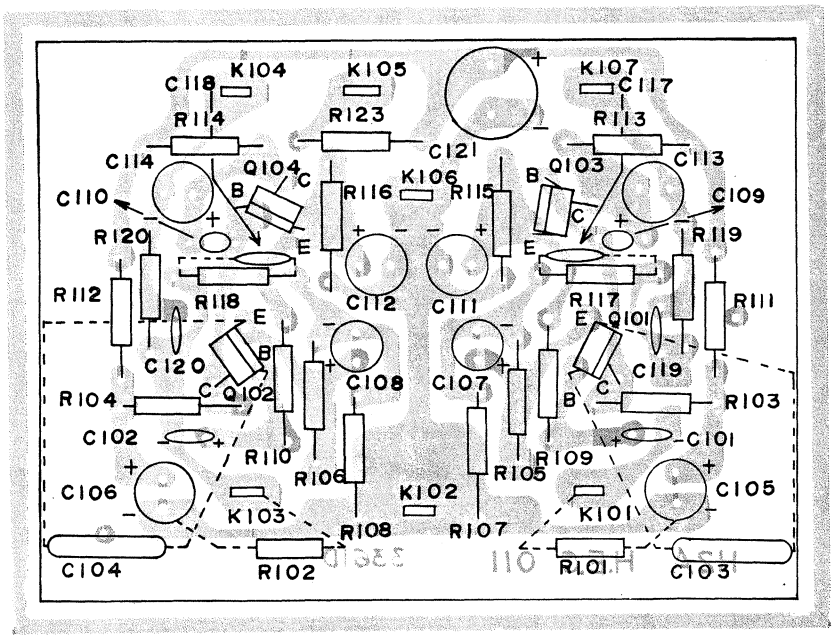


Figure 10 PRE AMP BOARD COMPONENT SIDE

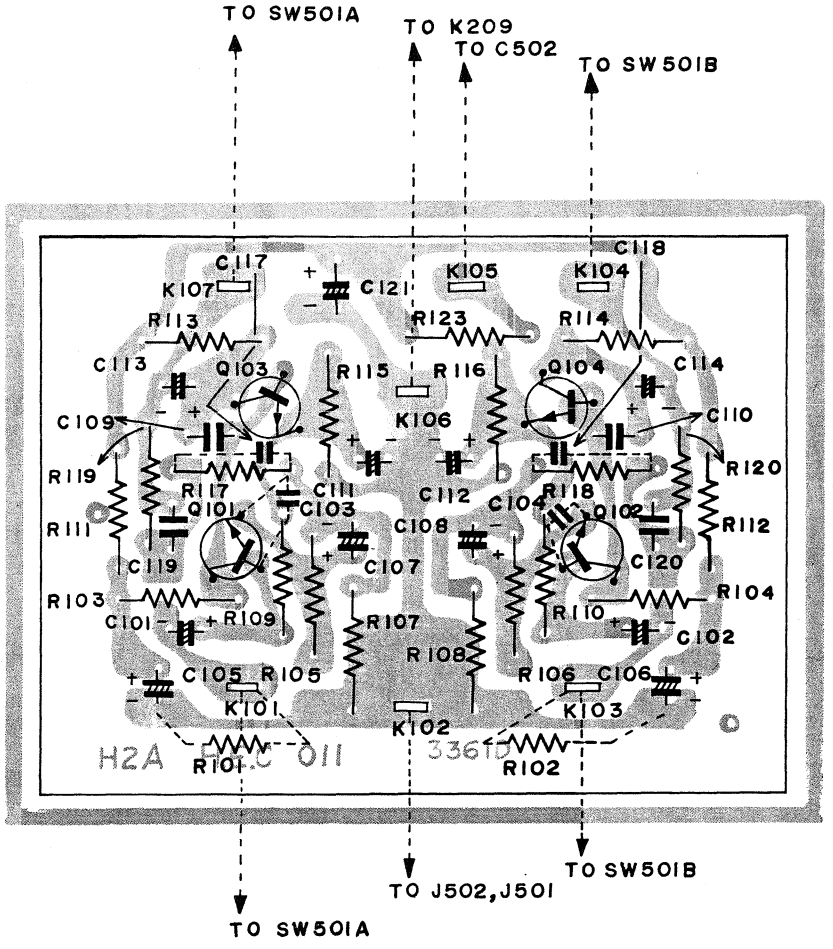
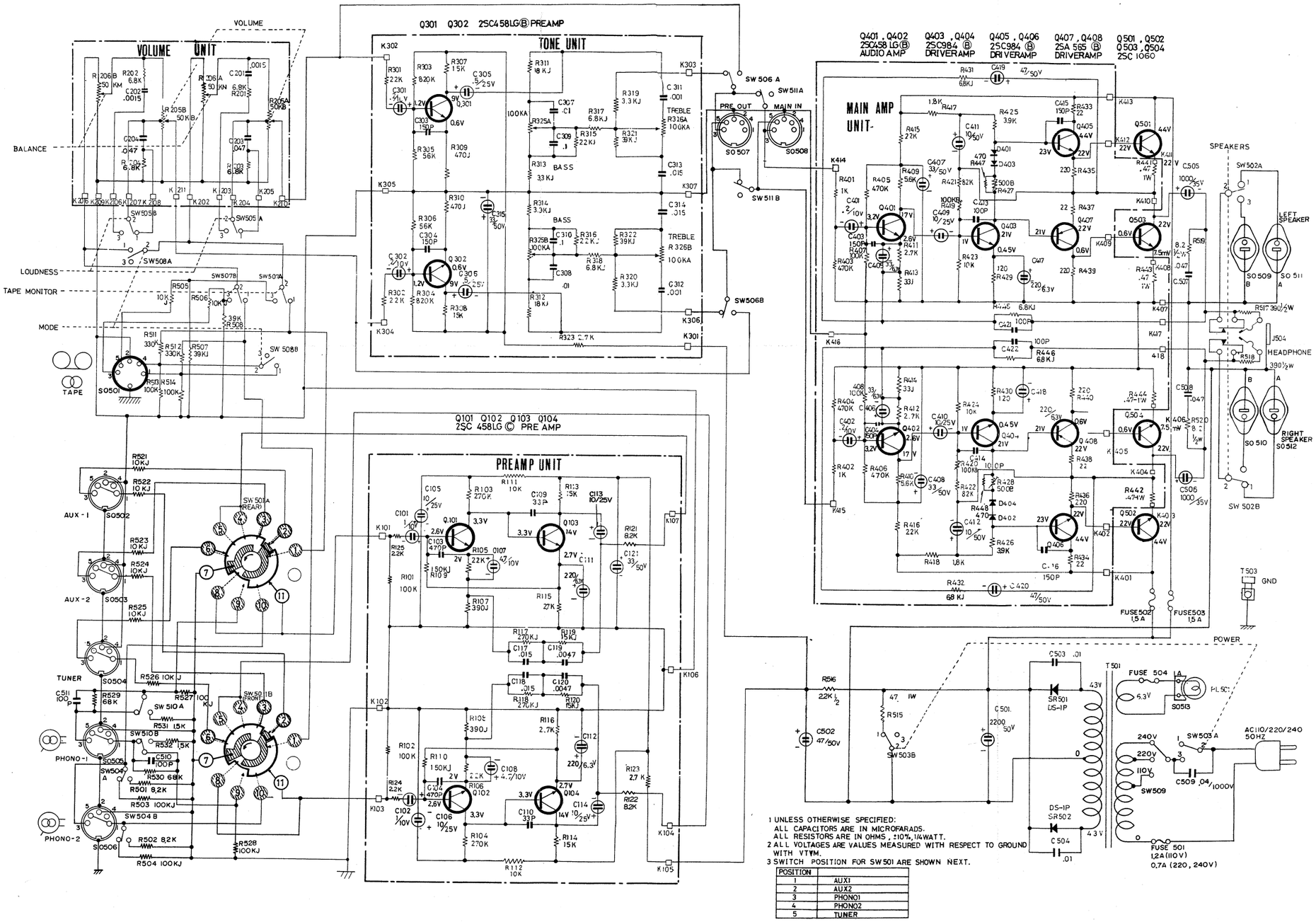


Figure 11 PRE AMP BOARD WIRING SIDE



1 UNLESS OTHERWISE SPECIFIED:
ALL CAPACITORS ARE IN MICROFARADS.
ALL RESISTORS ARE IN OHMS , ±10%, 1/4WATT.
2 ALL VOLTAGES ARE VALUES MEASURED WITH RESPECT TO GROUND WITH VTVM.
3 SWITCH POSITION FOR SW501 ARE SHOWN NEXT.

POSITION	
1	AUX1
2	AUX2
3	PHONO1
4	PHONO2
5	TUNER

Figure 12 SCHEMATIC DIAGRAM

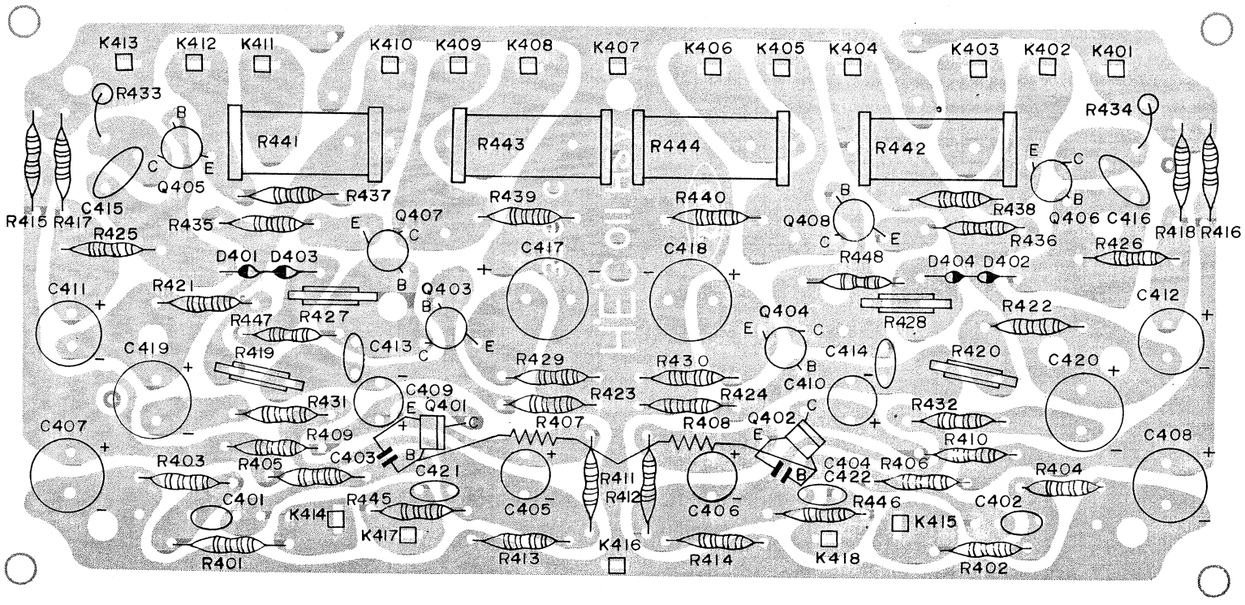


Figure 13 MAIN UNIT COMPONENT SIDE

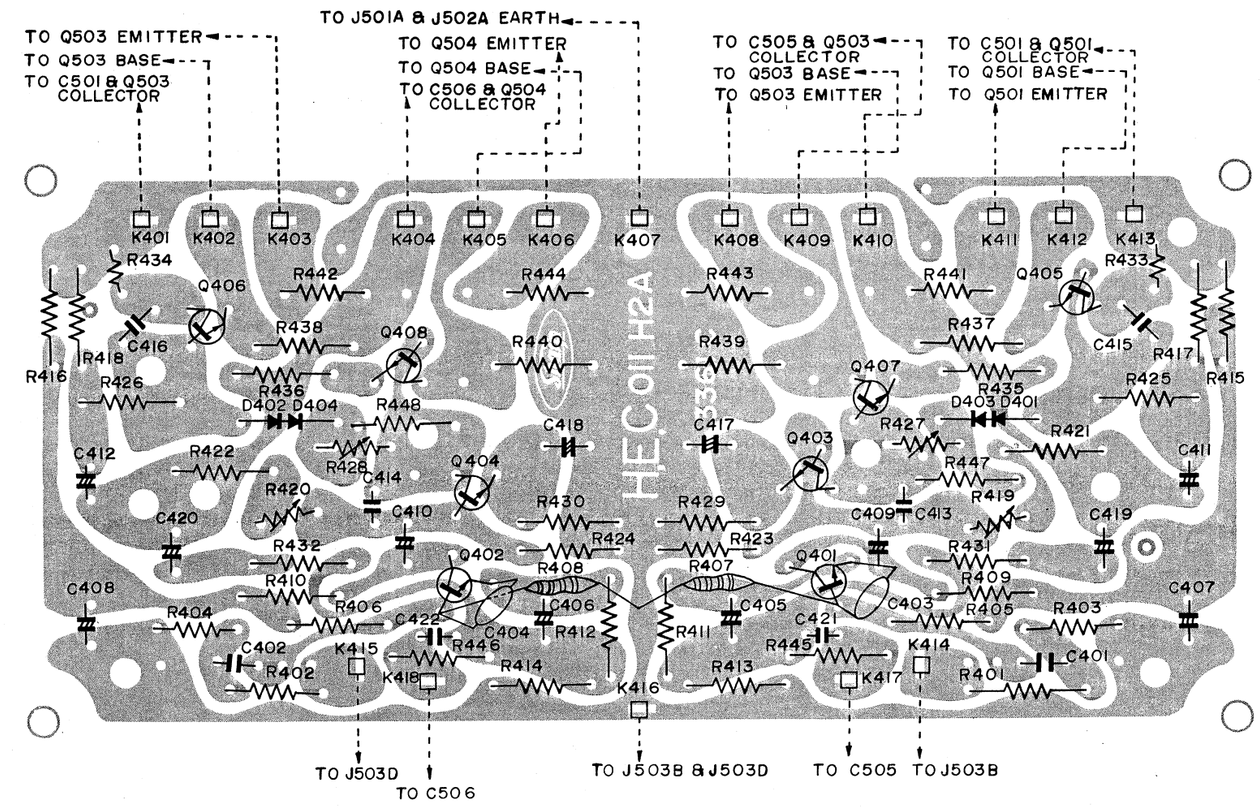


Figure 14 MAIN UNIT WIRING SIDE

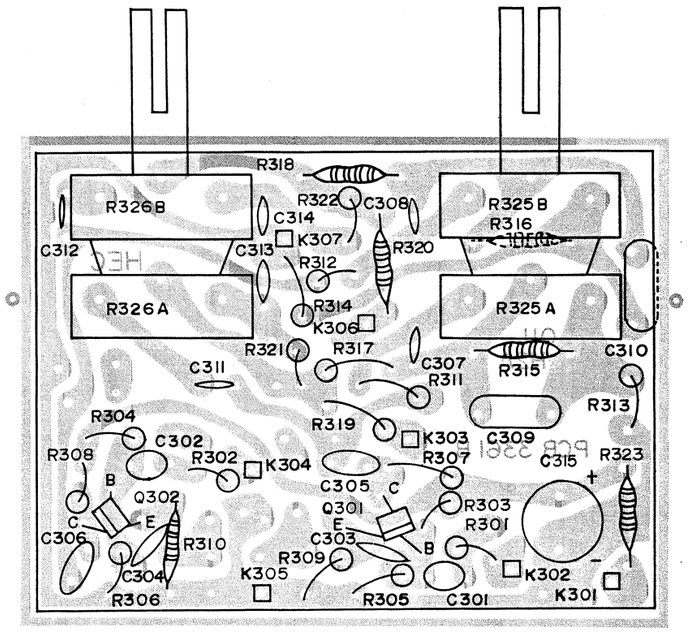


Figure 15 TONE UNIT COMPONENT SIDE

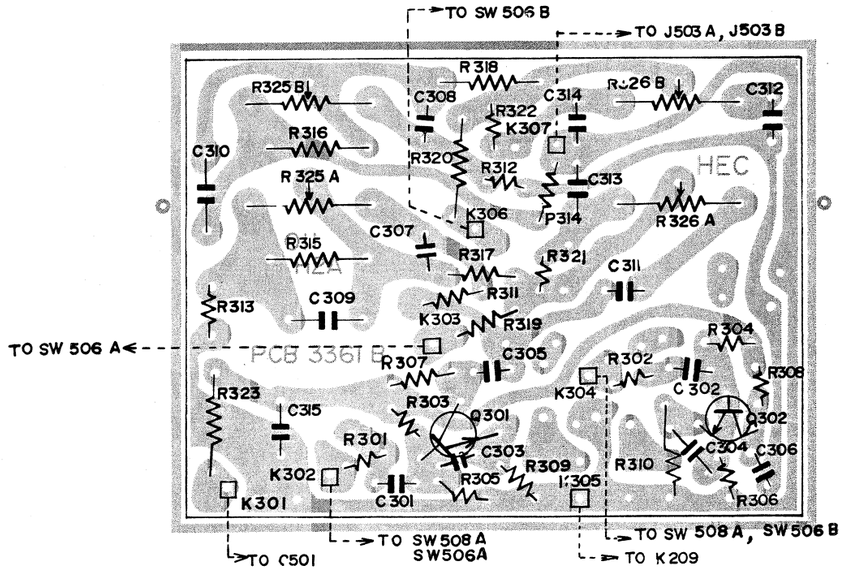


Figure 16 TONE UNIT WIRING SIDE

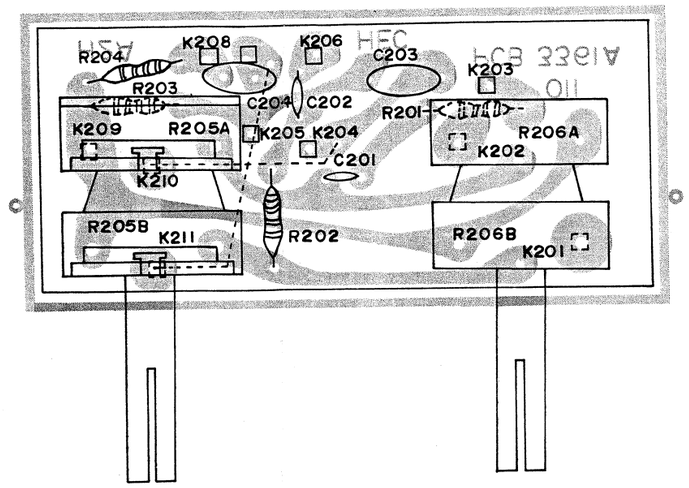


Figure 17 VOLUME UNIT COMPONENT SIDE

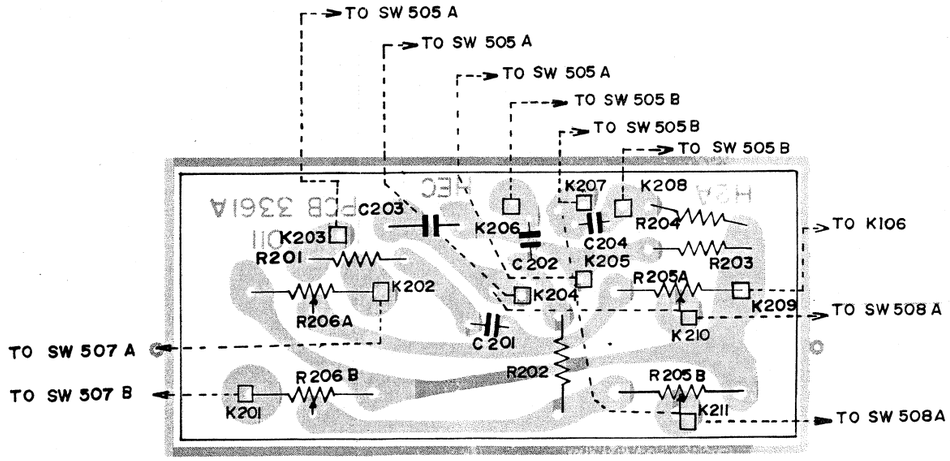
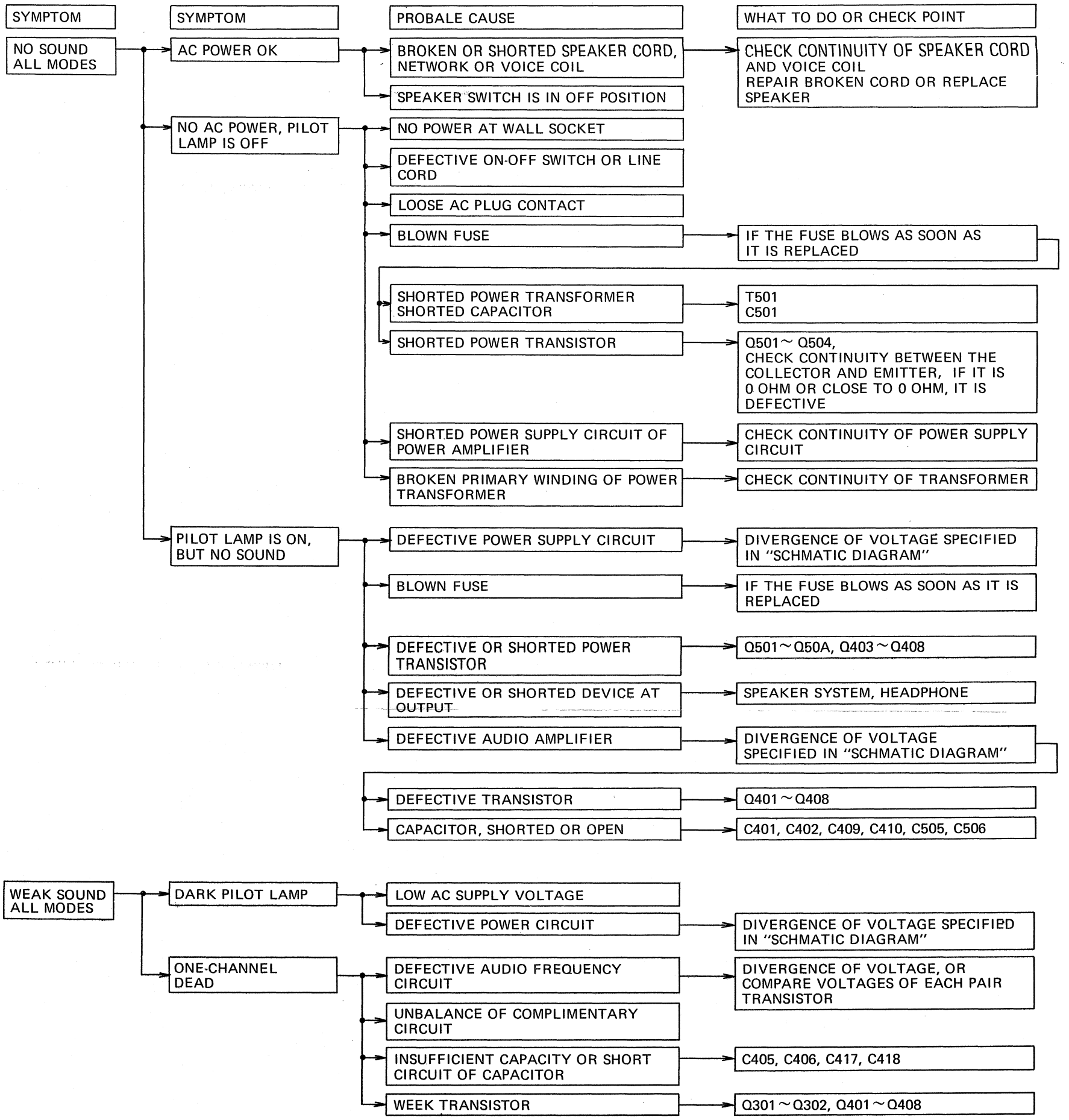


Figure 18 VOLUME UNIT WIRING SIDE

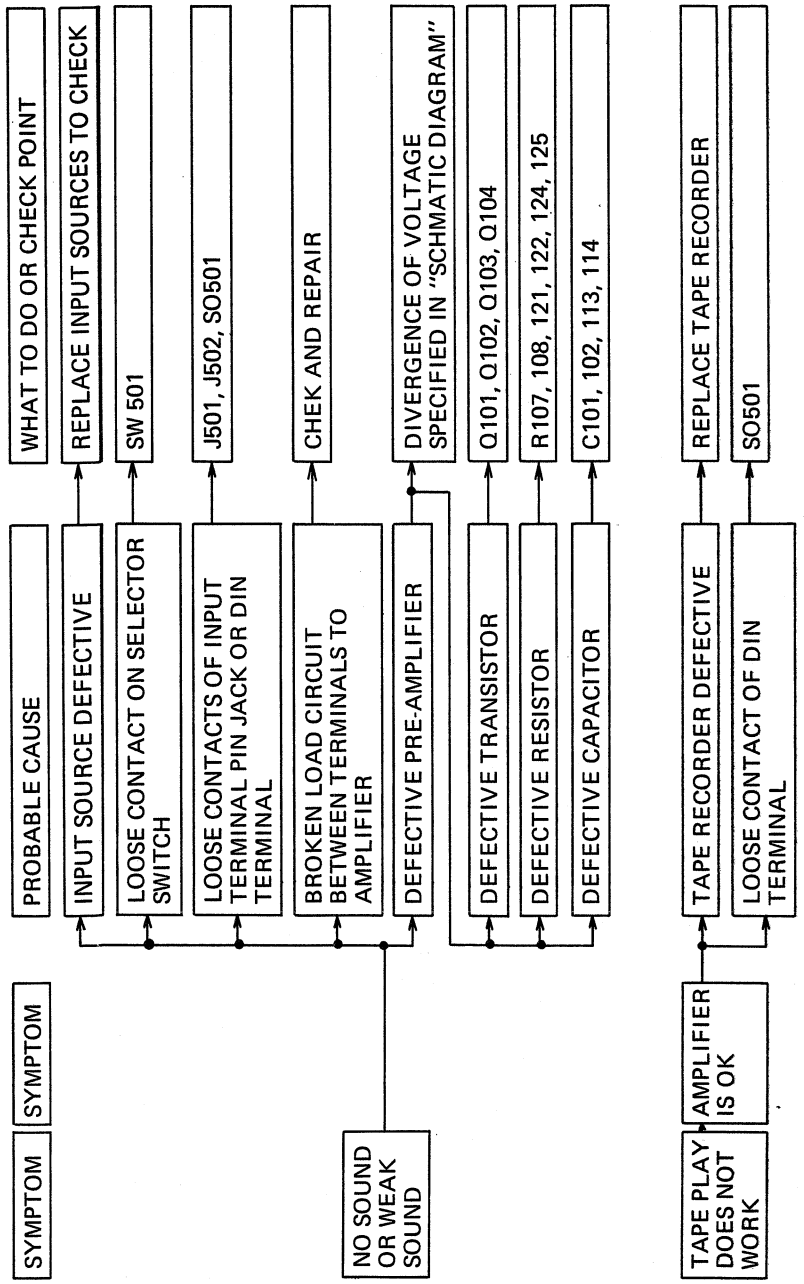
ALL OPERATIONAL MODES(1)


SYMPTOM
SYMPTOM
PROBALE CAUSE
WHAT TO DO OR CHECK POINT
NO SOUND ALL MODES
AC POWER OK
BROKEN OR SHORTED SPEAKER CORD, NETWORK OR VOICE COIL
CHECK CONTINUITY OF SPEAKER CORD AND VOICE COIL REPAIR BROKEN CORD OR REPLACE SPEAKER
SPEAKER SWITCH IS IN OFF POSITION
NO AC POWER, PILOT LAMP IS OFF
NO POWER AT WALL SOCKET
DEFECTIVE ON-OFF SWITCH OR LINE CORD
LOOSE AC PLUG CONTACT
BLOWN FUSE
IF THE FUSE BLOWS AS SOON AS IT IS REPLACED
SHORTED POWER TRANSFORMER SHORTED CAPACITOR
T501 C501
SHORTED POWER TRANSISTOR
Q501~ Q504, CHECK CONTINUITY BETWEEN THE COLLECTOR AND EMITTER, IF IT IS 0 OHM OR CLOSE TO 0 OHM, IT IS DEFECTIVE
SHORTED POWER SUPPLY CIRCUIT OF POWER AMPLIFIER
CHECK CONTINUITY OF POWER SUPPLY CIRCUIT
BROKEN PRIMARY WINDING OF POWER TRANSFORMER
CHECK CONTINUITY OF TRANSFORMER
PILOT LAMP IS ON, BUT NO SOUND
DEFECTIVE POWER SUPPLY CIRCUIT
DIVERGENCE OF VOLTAGE SPECIFIED IN "SCHMATIC DIAGRAM"
BLOWN FUSE
IF THE FUSE BLOWS AS SOON AS IT IS REPLACED
DEFECTIVE OR SHORTED POWER TRANSISTOR
Q501~Q50A, Q403~Q408
DEFECTIVE OR SHORTED DEVICE AT OUTPUT
SPEAKER SYSTEM, HEADPHONE
DEFECTIVE AUDIO AMPLIFIER
DIVERGENCE OF VOLTAGE SPECIFIED IN "SCHMATIC DIAGRAM"
DEFECTIVE TRANSISTOR
Q401~Q408
CAPACITOR, SHORTED OR OPEN
C401, C402, C409, C410, C505, C506
WEAK SOUND ALL MODES
DARK PILOT LAMP
LOW AC SUPPLY VOLTAGE
DEFECTIVE POWER CIRCUIT
DIVERGENCE OF VOLTAGE SPECIFIED IN "SCHMATIC DIAGRAM"
ONE-CHANNEL DEAD
DEFECTIVE AUDIO FREQUENCY CIRCUIT
DIVERGENCE OF VOLTAGE, OR COMPARE VOLTAGES OF EACH PAIR TRANSISTOR
UNBALANCE OF COMPLIMENTARY CIRCUIT
INSUFFICIENT CAPACITY OR SHORT CIRCUIT OF CAPACITOR
C405, C406, C417, C418
WEEK TRANSISTOR
Q301~Q302, Q401~Q408

ALL OPERATIONAL MODES(2)

SYMPTOM	SYMPTOM	PROBABLE CAUSE	WHAT TO DO OR CHECK POINT
DISTORTION IN ALL MODES OF OPERATION	REPLACE SPEAKER AND OK	DEFECTIV VOICE COIL, CONE OR DAMPER OF SPEAKER	REPLACE SPEAKER
		INSUFFICIENT VOLTAGE OF POWER CIRCUIT	VOLTAGES NOT AS SPECIFIED
	ONE CHANNEL IS OK, OTHER IS DISTORTED	DEFECTIVE AUDIO FREQUENCY CIRCUIT	
		AGING OR WEAK TRANSISTOR	Q301～Q302, Q401～Q408
		OPEN OR SHORTS IN NEGATIVE FEEDBACK CIRCUIT	C419, 420 R431, 432, 445, 446
HUM IN ALL MODES	HIGH LEVEL OF RIPPLE IN DC SOURCE	DEFECTIVE RIPPLE FILTER	C501
	RIPPLE IN POWER SUPPLY CIRCUIT OF PREAMPLIFIER	DEFECTIVE RIPPLE FILTER	C502, 315, 121, R516, 323, 123
		OPEN CIRCUIT OF GROUND CONNEC-TION BETWEEN PRE-AMPLIFIER AND CHASSIS	K102 TO CHASSIS
		SHORT CIRCUIT OF EARTH OF POWER AMPLIFIER OR OTHER AUDIO UNIT TO CHASSIS, ESPECIALLY HEADPHONE JACK TO CHASSIS	TONE UNIT TO CHASSIS, AF UNIT TO CHASSIS, J504 TO CHASSIS
NOISY IN ALL MODES	RESONANT SPEAKER	INNER CONTACT OF SPEAKER COMPONENT OR DUST	FIX SCREWS AGAIN, KEEP AWAY RESONANT TIP FROM CORN OF SPEAKER
		DEFECTIVE SPEAKER	REPLACE SPEAKER
	NOISY CONTROLS	DEFECTIVE VARIABLE RESISTOR	R205, R206, R325, R326
SPEAKER SWITCH DOES NOT WORK AT ALL	ALWAYS KEEP ON OR OFF	DEFECTIVE HEADPHONE	J504
		SHORT OR OPEN CIRCUIT OF HEADPHONE CIRCUIT	
		DEFECTIVE SPEAKER SWITCH	SW502
LOUDNESS CONTOUR SWITCH DOES NOT WORK AT ALL		VOLUME CONTROL IS IN OVER REVOLUTION	
		DEFECTIVE LOUDNES CONTOUR SWITCH OR CIRCUIT	R201～204, C201～204
CONTROL DOES DOES NOT WORK	BASS CONTROL	DEFECTIVE R 325A,B OR CIRCUIT	
	TREBLE CONTROL	DEFECTIVE R 326A,B OR CIRCUIT	
	BALANCE CONTROL	DEFECTIVE R 206A,B OR CIRCUIT	

USING WITH INPUT OR OUTPUT TERMINALS (PHONO TAPE etc.)



PARTS LIST

REF.NO.	PART NO.	DESCRIPTION
		RESISTORS
R101,R102	1544210421	100K ohm ¼ SA 100KK
R103,R104	1544227421	270K ohm ¼ SA 270KK
R105,R106	1544222321	22K ohm ¼ SA 22KK
R107,R108	1544239111	390 ohm, ¼W, 5%, Carbon ¼ SA 390J
R109,R110	1544215411	150K ohm, ¼W, 5%, Carbon ¼ SA 150KJ
R111,R112	1544210321	10K ohm ¼ SA 10KK
R113,R114	1544215321	15K ohm ¼ SA 15KK
R115,R116 R123	1544227221	2.7K ohm ¼ SA 2.7KK
R117,R118	1544227411	270K ohm, ¼W, 5%, Carbon ¼ SA 270KJ
R119,R120	1544215311	15K ohm, ¼W, 5%, Carbon ¼ SA 15KJ
R121,R122	1544282211	8.2K ohm, ¼W, 5%, Carbon ¼ SA 8.2KJ
R124,R125	1544222221	2.2K ohm ¼ SA 2.2KK
R201,R202, R203,R204	1544268221	6.8K ohm ¼ SA 6.8KK
R301,R302	1544222321	22K ohm ¼ SA 22KK
R303,R304	1544282421	820K ohm ¼ SA 820KK
R305,R306	1544256321	56K ohm ¼ SA 56KK
R307,R308	1544215321	15K ohm ¼ SA 15KK
R309,R310	1544247111	470 ohm, ¼W, 5%, Carbon ¼ SA 470J
R311,R312	1544218311	18K ohm, ¼W, 5%, Carbon ¼ SA 18KJ
R313,R314 R319,R320	1544233211	3.3K ohm, ¼W, 5%, Carbon ¼ SA 3.3KJ
R315,R316	1544222311	22K ohm, ¼W, 5%, Carbon ¼ SA 22KJ
R317,R318	1544268211	6.8K ohm, ¼W, 5%, Carbon ¼ SA 6.8KJ
R321,R322	1544239311	39K ohm, ¼W, 5%, Carbon ¼ SA 39KJ
R323	1544227221	2.7K ohm ¼ SA 2.7KK
R401,R402	1544210221	1K ohm ¼ SA 1KK
R403,R404, R405,R406	1544247421	470K ohm ¼ SA 470KK
R407,R408	1544210421	100K ohm ¼ SA 100KK
R409,R410	1544256221	5.6K ohm ¼ SA 5.6KK
R411,R412	1544227221	2.7K ohm ¼ SA 2.7KK
R413,R414	1544233011	33 ohm, ¼W, 5%, Carbon ¼ SA 33J
R415,R416	1544222321	22K ohm ¼ SA 22KK
R417,R418	1544218221	1.8K ohm ¼ SA 1.8KK
R421,R422	1544282321	470K ohm ¼ SA 470KK
R423,R424	1544210321	10K ohm ¼ SA 10KK
R425,R426	1544239221	3.9K ohm ¼ SA 3.9KK
R429,R430	1544212121	120 ohm ¼ SA 120K
R431,R432, R445,R446	1544268211	6.8K ohm, ¼W, 5%, Carbon ¼ SA 6.8KJ
R433,R434, R437,R438	1544222021	22 ohm ¼ SA 22K
R435,R436 R439,R440	1544222121	220 ohm ¼ SA 220K
R441,R442, R443,R444	1641347924	0.47 ohm, 1W, 10%, Resin 1LL-0.47K
R447,R448	1544247121	470 ohm ¼ SA 470K

REF.NO.	PART NO.	DESCRIPTION
R501,R502	1544282221	8.2K ohm ¼ SA 8.2KK
R503,R504	1544210421	100K ohm ¼ SA 100KK
R505,R506, R521,R522, R523,R524, R525,R526	1544210311	10K ohm, ¼W, 5%, Carbon ¼ SA 10KJ
R507,R508	1544239311	39K ohm, ¼W, 5%, Carbon ¼ SA 39KJ
R511,R512	1544233411	330K ohm, ¼W, 5%, Carbon ¼ SA 330KJ
R513,R514, R527,R528	1544210411	100K ohm, ¼W, 5%, Carbon ¼ SA 100KJ
R515	1537247024	47 ohm, 1W, 10%, Oxide film 1PO-47K
R516	1543222222	2.2K ohm, ½W, 10%, Carbon ½M-2.2KK
R517,R518	1543239122	390 ohm, ½W, 10%, Carbon ½M-390K
R519,R520	1543282822	8.2 ohm, ½W, 10%, Carbon ½M-8.2K
R529,R530	1544268321	68K ohm, ¼W, 10%, Carbon ¼ SA-68KK
R531,R532	1544215321	1.5K ohm, ¼W, 10%, Carbon ¼ SA-1.5KK

Unless otherwise specified resisters are ¼W, 10%, carbon type.

		CAPACITORS
C101,C102	1568310312	1MFD, 10V, 20%, Aluminum Electrolytic AD-1-103M
C103,C104	1552247727	470PF, 50V, 10%, Discap D-5-477K
C105,C106, C113,C114	1661210215	10MFD, 25V, +100%, −10%, Electrolytic CU2.5-102Q
C107,C108	1661247325	4.7MFD, 25V, +150%, − 10%, Electrolytic CU2.5-473R
C109,C110	1552233827	33PF, 50V, 10%, Discap D-5-338K
C111,C112	1661222112	220MFD, 10V, +100%, −10%, Electrolytic CU-1-221Q
C117,C118	1556215527	.015MFD, 50V, 10%, Mylar ML-5-155K
C119,C120	1556247627	4700PF, 50V, 10%, Mylar ML-5-476K
C121	1661233217	33MFD, 50V, +100%, −10%, Electrolytic CU-5-332Q
C201,C202	1556215627	1500PF, 50V, 10%, Mylar ML-5-156K
C203,C204	1556247527	.047MFD, 50V, 10%, Mylar ML-5-475K
C301,C302	1658322413	22MFD, 16V, 20%, Aluminum Electrolytic AD1.6-224M
C303,C304	1552215727	150PF, 50V, 10%, Discap D-5-157K
C305,C306	1658347415	.47MFD, 25V, 20%, Aluminum Electrolytic AD2.5-474M
C307,C308	1556210527	.01MFD, 50V, 10%, Mylar ML-5-105K
C309,C310	1556210427	.1MFD, 50V, 10%, Mylar ML-5-104K
C311,C312	1556210627	1000PF, 50V, 10%, Mylar ML-5-106K
C313,C314	1556215527	.015MFD, 50V, 10%, Mylar ML-5-155K
C315	1661233217	33MFD, 50V, +100%, −10%, Electrolytic CU-5-332Q
C401,C402	1658322412	.22MFD, 10V, 20%, Aluminum Electrolytic AD-1-224M
C403,C404, C415,C416	1552215727	150PF, 50V, 10%, Discap D-5-157K
C405,C406	1661233212	33MFD, 10V, +100%, −10%, Electrolytic CU-1-332Q

PARTS LIST

REF.NO.	PART NO.	DESCRIPTION
C407,C408	1661233217	33MFD, 50V, +100%, −10%, Electrolytic CU-5-332Q
C409,C410	1661210215	10MFD, 25V, +100%, −10%, Electrolytic CU2.5-102Q
C411,C412	1661210217	10MFD, 50V, +100%, −10%, Electrolytic CU-5-102Q
C413,C414, C421,C422	1552210727	100PF, 50V, 10%, Discap D-5-107K
C417,C418	1661222112	220MFD, 10V, +100%, −10%, Electrolytic CU-1-221Q
C419,C420	1661247217	47MFD, 50V, +100%, −10%, Electrolytic CU-5-472Q
C501	1654617500	2200MFD, 50V, +100%, −10%, 5L-220QB
C502	1661247217	47MFD, 50V, +100%, −10%, Electrolytic CU-5-472Q
C503,C504	1552603700	.01MFD, 500V, +100%, −10%, Discap D-50-105P
C505,C506	1661606300	1000MFD, 35V, +100%, −10%, Electrolytic CU3.5-100Q
C507,C508	1556247527	.047MFD, 50V, 10%, Mylar ML-5-475K
C509	1555240596	.04MFD, 10KV, 20%, Tubular OL-1K-405M
C510,C511	1552210727	100PF, 50V, 10%, Discap D-5-107K

SOCKETS, SWITCHES, JACK & FUSES

SO501	1320297100	Socket, DIN SO-971
SO502,SO503, SO504,SO505, SO506,SO507, SO508	1320297100	Socket, DIN, TAPE, AUX, TUNER, phono & PRE-MAIN AMP. SO-971 Connector
SO509,SO511	1320203500	Socket, DIN, Speaker, Left Channel SO-035
SO510,SO512	1320203500	Socket, DIN, Speaker, Right Channel SO-035
SO513	1320220800	Socket, Pilot Lamp SO-208
SW501	1531238100	Switch, Position Selector 3S-81
SW502	4531207300	Switch, Speaker XOS-73
SW503	4531209300	Switch, Power XOS-93
SW504	15312569	Switch, Impedance Canceller 5S-69
SW505	15312677	Switch, Loudness 6S-77
SW506	15312677	Switch, Tone Canceller 6S-77
SW507	15312677	Switch, Tape Monitor 6S-77
SW508	45312009	Switch, Mode XOS-09
SW509	1320203700	Switch, Auxiliary Power SO-037
SW510	15312569	Switch, Cartridge Selector 5S-69
SW511	15312569	Switch, MAIN AMP. Canceller 5S-69
J504	1530294500	Jack, Headphone J-945
F501	1590237100	Fuse, AC Supply, 1.2A FUSE-1.2S
F501	1590235500	Fuse, AC Supply, 0.7A FUSE-0.7S
F502, F503	1590236700	Fuse, Protection Circuit FUSE-1.5S
F504	1590237700	Fuse, Pilot Lamp, 1.0A FUSE-1.0S

REF.NO.	PART NO.	DESCRIPTION

CONTROLS

R205A, B	1548263200	50K ohm, Pot., Volume 8V-632
R206A, B	1548264300	50K ohm, Pot., Balance 8V-643
R325A, B	1548266000	100K ohm, Pot., Bass 8V-660
R326A, B	1548266000	100K ohm, Pot., Treble 8V-660
R419,R420	1548264700	100K ohm, Pot. Bias Current Adjust 8V-647
R427,R428	1548238700	500 ohm, Pot., Bias Current Adjust 8V-387

SEMICONDUCTORS

Q101,Q102, Q103,Q104	1522228530	Transistor, Pre-Amplifier 2SC 458LG Ⓒ
Q301,Q302 Q401,Q402	1522228520	Transistor, Pre-Amplifier 2SC 458LG Ⓑ
Q403,Q404, Q405,Q406	1522232528	Transistor, Driver, Amplifier 2SC 984 Ⓑ
Q407,Q408	1522236128	Transistor, Driver, Amplifier 2SA 565 Ⓑ
Q501,Q502, Q503,Q504	1522237320	Transistor, Power Amplifier 2SC1060 Ⓑ
D401,D402, D403,D404	1522263306	Diode, Protecting Bias HV-23 (BL)

MISCELLANEOUS

	1577298000	Main Amplifier Unit, Assembly M-AMP-UNIT
	1577298100	Pre Amplifier Unit, Assembly P-AMP-UNIT
	1577298200	Tone Control Unit, Assembly TONE-UNIT
	1577298300	Volume Control Unit, Assembly VOLUME-UNIT
	11022710	Cabinet, Assembly 2CAB-361
	11062591	Panel, Front PANEL-361
	11082231	Knob, Function Selector 8K-231
	11082350	Knob, Power-Switch and Speaker-Switch 8K-350
	11082351	Knob, Volume, Balance, Bass and Treble Control 8K-351
	11622067	Cover, Pilot Lamp PL-DEC-COV
	11923361	Board, Main Control ACRYL-361
	1192307253	Plate, Cabinet Bottom SOKOITA361
	4302220300	Chassis, Main Assembly X2MC-361
	1330206500	Plate, Heat Sink HON-P-361
	1393277432	Spacer, Headphone Jack SPAC4062D
	1193249100	Spacer, Headphone Jack SPAC4062B
	1392233700	Spacer, Headphone Jack SPACER911B
	1515265600	Transformer, Power 5T-656SEV
	1586232590	AC Cord, 2 wires ACC-325SEV
	1586230590	AC Cord, 2 wires with Plug ACC-305
	1586229700	AC Cord, 3 wires ACC-297
	1323243900	Plug, AC Cord PG-439
	1323217200	Plug, AC Cord PG-172
	1323217300	Plug, AC Cord PG-173
	1323218400	Plug, AC Cord PG-184
SR501, SR502	1522276500	Diode, Rectifier (SD-1P) SI-RECT-39
PL501	1590250300	Lamp, Pilot PL-503